

REMARKS

Claims 1-3, 5-7 and 9-21 are pending in the present application. Claims 1, 3, 5-7, 9 and 14 have been amended as a result of this response. Claims 4 and 8 have been canceled and new claims 15-21 have been added. Applicant respectfully submits that independent claims 1, 3 and 7 and dependent claims 2, 5-6 and 8-21 stand in condition for allowance.

I. Allowable Subject Matter

Applicant appreciates the Examiner's indication that claim 13 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Amended claim 3 consists of claim 13 rewritten in independent form. Independent claim 3 should now be in condition for allowance.

II. Drawing Objections

The Examiner has objected to the drawings under 37 CFR 1.83(a) for failing to show every feature of the invention specified in claim 13, specifically, the "turbulent portion formed in inner wall surface of each of the valve chambers."

Applicant respectfully submits that under 35 U.S.C. § 113, "The applicant shall furnish a drawing where necessary for the understanding of the subject matter sought to be patented." One example of a "turbulent portion formed in inner wall surface of each of the valve chambers" is clearly shown in Figure 2. The Applicant respectfully submits that it is not necessary to provide all possible combinations nor show every element of every claim through a single drawing, rather it is only required that a drawing be furnished "for the understanding of the subject matter sought to be patented" and Figure 2 clearly provides an example of the claimed element. Applicant respectfully requests withdrawal of the objection.

III. Claim Rejections Under 35 U.S.C. § 102(b)

The Examiner has rejected claims 1-5, 7-12 and 14 under 35 U.S.C. § 102(b) as being anticipated by Umeda et al. (J.P. 2001-12825 A). These rejections are respectfully traversed.

Umeda et al. discloses a throttle device, more specifically, a collimator interposed into the hydraulic circuit which fluid flows through. The valve rod (1) can move such that it can control the amount of fluid flowing from the inlet to the outlet. The collimator also includes slots formed in either the valve seat or valve rod to allow fluid to flow through the passage. Umeda et al. does not have any features that create turbulence in the passage upstream of the valve port. While the step surface (12d) may create a small diversion for fluid flow, the step surface (12d) does not create turbulence within the passage upstream of the valve port.

The present invention discloses an expansion valve for a refrigeration apparatus that allows fluid to flow through the valve chamber from the inlet to the outlet. The expansion valve includes a turbulent portion “for causing turbulence in the refrigerant flow in the refrigerant passage upstream of the orifice” (Claims 1 and 7). The turbulent portion is important to this invention as it causes refrigerant flow turbulence in the refrigerant passage upstream from the orifice (Specification, page 4, lines 6-11). In addition, the turbulent portion enables fine and uniform dispersion of gas bubbles in the refrigerant flow without reducing the pressure of the refrigerant and subsequently reduces the noise produced (Specification, page 6, lines 1-8). Independent claims 1 and 7 have been amended to include further defining features. In addition, amended independent claim 3 is allowable for the reasons previously presented above; specifically claim 3 consists of claim 13 rewritten in independent form.

Umeda et al. fails to disclose an expansion valve with “a turbulent portion for causing turbulence in the refrigerant flow in the refrigerant passage upstream of the orifice” (Claims 1 and 7). In addition, Umeda et al. fails to disclose a turbulent portion “formed in the inner surface of the valve chamber” (Claim 1). Umeda et al. fails to disclose an expansion valve with a turbulent portion “defined by a meandering refrigerant passage upstream of the orifice between the valve element and the valve seat where the meandering refrigerant passage includes an axial passage” (Claim 7). In addition Umeda et al. fails to disclose an axial passage “which guides the refrigerant flow in an axial direction of the valve element between the valve element and a wall surface of the valve chamber” and “an oblique passage, which obliquely changes the direction of the refrigerant flow from the axial passage” (Claim 7). Also, Umeda et al. fails to disclose an

expansion valve with where “the valve element has a distal end having a needle valve in the center of the valve element and a recess portion defined between a center point of the needle valve and an outer surface of the valve element and the valve seat defined by a projection towards the valve element” (Claim 7).

Accordingly, for at least these reasons, independent claims 1, 3 and 7 are clearly distinguishable over Umeda et al. Applicant submits that claims 2, 5 and 9-14 are allowable at least by virtue of their dependency on claims 1, 3 and 7. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

IV. New Claims 15-21

Applicant submits that new claims 15-21, which depend from amended independent claims 3 and 7 should be allowable for at least the reasons presented above.

V. Claim Rejections Under 35 U.S.C. § 103(a)

The Examiner has rejected claim 6 under 35 U.S.C. § 103(a) as being unpatentable over Umeda et al. (J.P. 2001-12825 A) in view of Tanasawa et al. (U.S. Patent No. 4,365,746). Applicant respectfully traverses the rejection.

Tanasawa et al. does not remedy the noted deficiencies of Umeda et al. Tanasawa et al. is only relied upon to teach dependent claim features. This reliance on Tanasawa et al. fails to make up for the deficiencies of Umeda et al. discussed above with respect to independent claims 1, 3 and 7. Therefore, the asserted combination of Umeda et al. and Tanasawa et al. (assuming these references may be combined, which Applicant does not admit) fails to establish *prima facie* obviousness of any pending claim.

Accordingly, for at least these reasons, claim 6 is clearly distinguishable over Umeda et al. in view of Tanasawa. Applicant submits that claim 6 is allowable at least by virtue of its dependency on claim 3. Accordingly, reconsideration and withdrawal of this rejection is respectfully requested.

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VI. Conclusion

All matters having been addressed in view of the foregoing, Applicant respectfully requests the entry of this Amendment, the Examiner's reconsideration of this application, and the immediate allowance of all pending claims.

Applicant's undersigned representative remains ready to assist the Examiner in any way to facilitate and expedite the prosecution of this matter. If any point remains an issue in which the Examiner feels would be best resolved through a personal or telephone interview, please contact the undersigned at the telephone number listed below.

Please charge any fees associated with the submission of this paper to Deposit Account No. 02-2448. The Commissioner for Patents is also authorized to credit any overpayments to the above-referenced deposit account.

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Respectfully submitted,

By _____

D. Richard Anderson

Registration No.: 40,439

BIRCH, STEWART, KOLASCH & BIRCH, LLP
8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant